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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/533,890	07/01/2005	Peter Persoone	016782-0327	9698

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FOLEY AND LARDNER LLP
SUITE 500
3000 K STREET NW
WASHINGTON, DC 20007

EXAMINER	
XU, LING X	

ART UNIT	PAPER NUMBER
1794	

MAIL DATE	DELIVERY MODE
01/22/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/533,890	PERSOONE ET AL.	
	Examiner	Art Unit	
	Ling Xu	1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 January 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4 and 7-12* is/are pending in the application.

4a) Of the above claim(s) *10 and 11* is/are withdrawn from consideration.

5)☒ Claim(s) *1-4, 7-9, and 12* is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 1/13/2009 has been entered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3 and 7-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Miyazaki et al. (US 5,419,969).

Regarding claims 1-3, Miyazaki discloses a multilayered coating formed on a substrate wherein the coating is comprised of alternating layers of oxide films and Ag films (column 2, lines 3-15). Miyazaki also teaches that the Ag films will exfoliate from the oxide film at the interface of the Ag and oxide films, (column 3, lines 31-40). In order to improve adhesion at the interface, an interstitial (intermediate) layer is formed of a

material such as gold (column 7, lines 45-59). The interstitial layer can be formed on both sides of the interface between the Ag film and the oxide film (col. 7, lines 36-40). The oxide film can be TiO2 (col. 8, lines 15-20).

As the coated substrate comprising the same layered structure as claimed, the same layered structure would also have the same properties such as those recited in claims 1-2.

Regarding claims 7-8, Miyazaki discloses that the silver layers have a thickness of 100A (10nm) (col. 4, lines 40-45) and the oxide layers have a thickness of 200-700 A (20-70nm) (col. 8, lines 65-67).

Regarding claim 9, Miyazaki discloses that the layered structure can be used as a heat mirror (col. 1, lines 18-22).

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 4 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyazaki, as applied to claim 1 above, and further in view of Okimura ("Low Temperature Growth Of Rutile TiO2 Films In Modified Rf Magnetron Sputtering", Surface and Coatings Technology, Volume 135, Issues 2-3, 15 January 2001, Pages 286-290).

As stated above, Miyazaki discloses the same layered structure as recited in claim 1.

Miyazaki discloses the oxide layer comprising TiO2 (TiOx, when x is 2) but does not specify that the TiO2 is in rutile form. However, it is well known in the art that titanium dioxide is manufactured in two crystal forms: anatase and rutile. The rutile form of titanium dioxide has a higher reflective index than the anatase form and as a result, the rutile form will have greater reflectivity than the anatase form. Therefore, it is more desirable to use the high reflective index rutile form of titanium dioxide in an infra-red reflecting layered structure.

Okimura teaches that titanium dioxide TiO2 is used for optical coatings due to its high refractive index. The rutile TiO2 which is known to have a high temperature stable phase has a higher refractive index, 2.72, than that of anatase TiO2 2.52, at a wavelength of 500 nm (page 286, column 1).

Therefore, it would have been obvious to one of ordinary skill in the art to use rutile form of titanium dioxide as a metal oxide layer in the layered structure disclosed by Miyazaki in order to provide a high temperature stable and high reflective index metal oxide layer.

It should be noted that claim 12 is a product-by-process claim. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). In this case, the combination of Miyazaki and

Okimura discloses the same product as claimed, the combination of Miyazaki and Okimura meets the claimed product limitations even through the TiO2 product disclosed by Okimura is made by a different process (i.e. the radio frequency magnetron sputtering process).

4. Claims 1-3 and 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oyama et al. (US 4,996,105) in view of Miyazaki et al. (US 5,419,969).

Regarding claims 1-3 and 9, Oyama discloses a transparent substrate coated with a coating, wherein the coating comprises: a first transparent oxide layer formed on the substrate, a second Ag layer formed on the first oxide, a third transparent oxide layer formed on the second Ag layer, a fourth Ag layer formed on the third oxide layer, and a fifth transparent oxide layer formed on the fourth Ag layer (column 3, lines 3-15). The transparent oxide layer can be TiO2 having a refractive index of 2.4 (column 4, lines 40-43). The transparent substrate can be a sheet glass (column 4, lines 8-17). It is preferred that the coated glass substrate has a visible transmittance of particularly at least 70% (column 5, lines 56-65).

As the coated substrate comprising the same layered structure as claimed and has a visible light transmittance of at least 70%, it would be expected that the coated substrate would exhibit the other optical and/or physical characteristics such as those recited in claims 1-2 and capable of functioning as a heat mirror as recited in claim 9, absent a showing to the contrary.

Regarding claims 7-8, example 5 of Oyama demonstrates that Ag layers have a thickness of about 100 angstroms (10 nm). The metal oxide layers have a thickness of about 350 angstroms (35 nm) and about 700 angstroms (70 nm).

Oyama also discloses that an interlayer (intermediate layer) may be inserted at the interface between adjacent layers (column 5, lines 33-38). The interlayer (intermediate layer) can be added to improve the adhesion of the coating layers (column 5, lines 33-38).

Oyama does not specifically disclose the composition of the interlayer and the protective function of the interlayer.

Miyazaki teaches a multilayered coating formed on a substrate wherein the coating is comprised of alternating layers of oxide films and Ag films (column 2, lines 3-15). Miyazaki also teaches that the Ag layers will exfoliate from the oxide film at the interface of the Ag and oxide films, (column 3, lines 31-40). In order to improve adhesion at the interface, an interstitial (intermediate) layer is formed of a material such as gold (column 7, lines 45-59). The interstitial layer can be formed on both sides of the interface between the Ag film and the oxide film (col. 7, lines 36-40).

Oyama and Miyazaki disclose analogous inventions related to coated substrates comprised of alternating layers of oxides and Ag. It would have been obvious to one skilled in the art at the time of invention to modify the interlayer of Oyama with the gold based interstitial layer of Miyazaki in order to limit the exfoliation at the oxide/Ag interface(s) by increasing the adhesion of the layers (Miyazaki, column 7, lines 33-59).

Since the combination of Oyama and Miyazaki discloses the coated substrate with the same structure including the interlayer(intermediate layer) made from the same material such as gold, it would be expected that the same interlayer or intermediate layer disclosed by Oyama and Miyazaki would also has the same protective function as the claimed intermediate layer.

5. Claims 4 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oyama and Miyazaki, as applied to claim 1 above, and further in view of Okimura ("Low Temperature Growth Of Rutile TiO2 Films In Modified RF Magnetron Sputtering", Surface and Coatings Technology, Volume 135, Issues 2-3, 15 January 2001, Pages 286-290).

As stated above, the combination of Oyama and Miyazaki discloses the same layered structure as recited in claim 1.

Oyama discloses that the oxide layer comprising TiO2 (TiOx, when x is 2) but does not specify that the TiO2 is in rutile form. However, it is well known in the art that titanium dioxide is manufactured in two crystal forms: anatase and rutile. The rutile form of titanium dioxide has a higher reflective index than the anatase form and as a result, the rutile form will have greater reflectivity than the anatase form. Therefore, it is more desirable to use the high reflective index rutile form of titanium dioxide in an infra-red reflecting layered structure.

Okimura teaches that titanium dioxide TiO2 is used for optical coatings due to its high refractive index. The rutile TiO2 which is known to have a high temperature stable

phase has a higher refractive index, 2.72, than that of anatase TiO2 2.52, at a wavelength of 500 nm (page 286, column 1).

Therefore, it would have been obvious to one of ordinary skill in the art to use rutile form of titanium dioxide as a metal oxide layer in the layered structure disclosed by Oyama and Miyazaki in order to provide a high temperature stable and high reflective index metal oxide layer.

It should be noted that claim 12 is a product-by-process claim. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). In this case, the combination of Oyama, Miyazaki, and Okimura discloses the same product as claimed, the combination of Oyama, Miyazaki, and Okimura meets the claimed product limitations even through the TiO2 product disclosed by Oyama and Okimura is made by a different process (i.e. the radio frequency magnetron sputtering process).

Response to Arguments

6. Applicants' arguments filed on 1/13/2009 have been fully considered but they are not persuasive.

Applicants argue that neither Oyama nor Miyazaki discloses at least the recited feature of independent claim 1. In particular, it is submitted that secondary citation to Miyazaki does not remedy the conceded deficiency in the primary citation to Oyama. Miyazaki does not disclose an interstitial layer deposited on both sides of the Ag layer.

Applicants' arguments are not persuasive. As stated in the above Office action, Miyazaki clearly teaches that the interstitial layer deposited on both sides of the Ag layer (col. 7, lines 36-40).

With respect to new claim 12, Applicants' argument has been addressed in the Claim Rejections above.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ling Xu whose telephone number is 571-272-7414. The examiner can normally be reached on 8:00 am- 4:30 pm, Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye can be reached on 571-272-3186. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Ling Xu
Primary Examiner
Art Unit 1794

/Ling Xu/
Primary Examiner, Art Unit 1794

Lx
January 20, 2009